

In the Claims

1. (Original) A liquid crystal display apparatus comprising:
 - a first substrate including a first display part having a pixel electrode;
 - a second substrate including a second display part having a common electrode that faces the pixel electrode;
 - a liquid crystal layer interposed between the first and second substrates;
 - a seal line including a liquid crystal inlet, the seal line defining the first and second display parts;
 - a first spacer disposed between the first and second display parts, the first spacer maintaining a cell gap formed between the first and second substrates; and
 - a second spacer disposed near the liquid crystal inlet, the second spacer maintaining the cell gap.
2. (Original) The liquid crystal display apparatus of claim 1, wherein the first and second spacers are formed on the first substrate.
3. (Original) The liquid crystal display apparatus of claim 2, wherein the seal line is formed on the first substrate;
4. (Original) The liquid crystal display apparatus of claim 2, wherein a number of the second space is plural, and the second spacers are arranged in a line.
5. (Original) The liquid crystal display apparatus of claim 4, wherein the line is substantially perpendicular to a liquid crystal injection direction.
6. (Original) The liquid crystal display apparatus of claim 2, wherein a number of the first spacer is greater than a number of the second spacer, and a supporting force of the first spacer per unit area is substantially same as the supporting force of the second spacer per unit area.

7. (Currently Amended) The liquid crystal display apparatus of claim 2, wherein a width of the liquid crystal inlet is in a range ~~from~~ of about 11 mm to about 20 mm, a number of the second spacer is plural, a first distance between the second spacers is in a range ~~from~~ of about 1.5 mm to about 2.0 mm, and a second distance between the second spacer and an edge of the liquid crystal inlet is in a range ~~from~~ of about 0.5 mm to about 1.5 mm.

8. (Original) The liquid crystal display apparatus of claim 2, further comprising a sealing member that seals the liquid crystal inlet, the sealing member being spaced apart from the second spacer.

9. (Original) The liquid crystal display apparatus of claim 8, wherein the sealing member comprises a material that is hardened when an ultraviolet light is irradiated.

10. (Withdrawn) The liquid crystal display apparatus of claim 2, wherein a number of the second spacer is plural, and the second spacers are arranged substantially in parallel to a liquid crystal injection direction.

11. (Withdrawn) The liquid crystal display apparatus of claim 2, wherein a number of the second spacer is plural and the second spacers are arranged in a zigzag form.

12. (Original) The liquid crystal display apparatus of claim 2, wherein the second spacer has a cylindrical shape, a triangular prism shaper of which an edge facing a liquid crystal injection direction, or an elliptical column shaper of which long axis is in parallel the liquid crystal injection direction.

13. (Withdrawn) The liquid crystal display apparatus of claim 1, wherein the first and second spacers are formed on the second substrate.

14. (Withdrawn) The liquid crystal display apparatus of claim 13, wherein the seal line is formed on the second substrate.

15. (Withdrawn) The liquid crystal display apparatus of claim 13, wherein a number of the second space is plural, and the second spacers are arranged in a line.

16. (Withdrawn) The liquid crystal display apparatus of claim 13, wherein the line is substantially perpendicular to a liquid crystal injection direction.

17. (Withdrawn) The liquid crystal display apparatus of claim 13, wherein a number of the first spacer is greater than a number of the second spacer, and a supporting force of the first spacer per unit area is substantially same as the supporting force of the second spacer per unit area.

18. (Withdrawn) The liquid crystal display apparatus of claim 13, wherein a width of the liquid crystal inlet is in a range from about 11 mm to about 20 mm, a number of the second spacer is plural, a first distance between the second spacers is in a range from about 1.5 mm to about 2.0 mm, and a second distance between the second spacer and an edge of the liquid crystal inlet is in a range from about 0.5 mm to about 1.5 mm.

19. (Withdrawn) The liquid crystal display apparatus of claim 13, further comprising a sealing member that seals the liquid crystal inlet, the sealing member being spaced apart from the second spacer.

20. (Withdrawn) The liquid crystal display apparatus of claim of claim 19, wherein the sealing member comprises a material that is hardened when an ultraviolet light is irradiated.

21. (Withdrawn) The liquid crystal display apparatus of claim 13, wherein a number of the second spacer is plural and the second spacers are arranged substantially in parallel to a liquid crystal injection direction.

22. (Withdrawn) The liquid crystal display apparatus of claim 13, wherein a number of the second spacer is plural and the second spacers are arranged in a zigzag form.

23. (Withdrawn) The liquid crystal display apparatus of claim 13, wherein the second spacer has a cylindrical shape, a triangular prism shape of which an edge facing a liquid crystal injection direction, or an elliptical column shape of which long axis is in parallel the liquid crystal injection direction.

24. (Original) A method of manufacturing a liquid crystal display apparatus, comprising:

forming a first display part on a first mother substrate;

forming a second display part on a second mother substrate, such that the second display part faces the first display part;

forming a seal line having a liquid crystal inlet along a boundary of the first display part;

forming first and second spacers on the first display part and outside of the first display part corresponding to the liquid crystal inlet respectively;

assembling the first and second mother substrates together;

separating the first and second display parts from the first and second mother substrates;

injecting a liquid crystal material into between the first and second display parts via the liquid crystal inlet; and

sealing the liquid crystal inlet.

25. (Original) The method of claim 24, wherein a third spacer is formed on the outside of the first display part so as to prevent a cell gap from being narrowed.

26. (Original) The method of claim 25, wherein a number of the second spacer and a number of the third spacer are plural respectively, and the second and third spacers are arranged in a line respectively.

27. (Original) The method of claim 26, wherein the line is substantially perpendicular to a liquid crystal injection direction.

28. (Original) The method of claim 25, wherein a number of the first spacer, a number of the second spacer and a number of the third spacer are plural respectively, the number of the first spacer is greater than the number of the second spacer and the number of the third spacer, and a supporting force of the first spacer per unit area is substantially same as the supporting force of the second and third spacers per unit area.

29. (Currently Amended) The method of claim 25, wherein a width of the liquid crystal inlet is in a range ~~from~~ of about 11 mm to about 20 mm, a number of the second spacer and a number of the third spacer are plural, a first distance between the second spacers and between the third spacers is in a range ~~from~~ of about 1.5 mm to about 2.0 mm, and a second distance between the second spacer and an edge of the liquid crystal inlet and between the third spacer and the edge of the liquid crystal inlet is in a range ~~from~~ of about 0.5 mm to about 1.5 mm.

30. (Original) The method of claim 25, wherein a number of the second spacer and a number of the third spacer are plural respectively, and each of the second spacer and each of the third spacer are arranged in a line that is substantially perpendicular to a liquid crystal injection direction.

31. (Withdrawn) The method of claim 25, wherein a number of the second spacer and a number of the third spacer are plural respectively, and the second and third spacers are disposed alternately to form a zigzag shape.

32. (Original) The method of claim 25, wherein the second spacer has a cylindrical shape, a triangular prism shape of which an edge facing a liquid crystal injection direction, or an elliptical column shape of which long axis is in parallel the liquid crystal injection direction.

33. (Original) The method of claim 24, wherein the liquid crystal inlet is sealed by a sealing member.

34. (Original) The method of claim 33, wherein the sealing member comprises a material that is hardened when an ultraviolet light is irradiated.

35. (Original) The method of claim 24, wherein (a) the first display part includes i) a first electrode, ii) a switching device that is electrically connected to the first electrode, iii) a first wiring that is electrically connected to the switching device so as to apply a first voltage to the first electrode, and iv) a second wiring that is electrically connected to the switching device so as to determine a time for applying the first voltage to the first electrode, and (b) the second display part includes a second electrode facing the first electrode.

36. (Withdrawn) A method of manufacturing a liquid crystal display apparatus, comprising:

forming a first display part on a first mother substrate;

forming a second display part on a second mother substrate, such that the second display part faces the first display part;

forming a seal line having a liquid crystal inlet along a boundary of the second display part;

forming first and second spacers on the second display part and outside of the second display part corresponding to the liquid crystal inlet respectively;

assembling the first and second mother substrate together;

separating the first and second display parts from the first and second mother substrates;

injecting a liquid crystal material into between the first and second display parts via the liquid crystal inlet; and

sealing the liquid crystal inlet.

37. (Withdrawn) The method of claim 36, wherein a third spacer is formed on the outside of the second display part so as to prevent a cell gap from being narrowed.

38. (Withdrawn) The method of claim 37, wherein a number of the second spacer and a number of the third spacer are plural respectively, the second and third spacers arranged in a line respectively.

39. (Withdrawn) The method of claim 38, wherein the line is substantially perpendicular to a liquid crystal injection direction.

40. (Withdrawn) The method of claim 37, wherein a number of the first spacer, a number of the second spacer and a number of the third spacer are plural respectively, the number of the first spacer is greater than the number of the second spacer and the number of the third spacer, and a supporting force of the first spacer per unit area is substantially same as the supporting force of the second and third spacers per unit area.

41. (Withdrawn) The method of claim 37, wherein a width of the liquid crystal inlet is in a range from about 11 mm to about 20 mm, a number of the second spacer and a number of the third spacer are plural, a first distance between the second spacers and between the third spacers is in a range from about 1.5 mm to about 2.0 mm, and a second distance between the second spacer and an edge of the liquid crystal inlet and between the third spacer and the edge of the liquid crystal inlet is in a range from about 0.5 mm to about 1.5 mm.

42. (Withdrawn) The method of claim 37, wherein a number of the second spacer and a number of the third spacer are plural respectively, and each of the second spacer and each of the third spacer are arranged in a line that is substantially perpendicular to a liquid crystal injection direction.

43. (Withdrawn) The method of claim 37, wherein a number of the second spacer and a number of the third spacer are plural respectively, and the second and third spacers are disposed alternately to form a zigzag shape.

44. (Withdrawn) The method of claim 37, wherein the second spacer has a shape selected from the group consisting of cylinder, a triangular prism of which an edge facing a liquid crystal injection direction, an elliptical column of which long axis is in parallel the liquid crystal injection direction.

45. (Withdrawn) The method of claim 36, wherein the liquid crystal inlet is sealed by a sealing member.

46. (Withdrawn) The method of claim 45, wherein the sealing member comprises a material that is hardened when an ultraviolet light is irradiated.

47. (Withdrawn) The method of claim 36, wherein (a) the first display part includes i) a first electrode, ii) a switching device that is electrically connected to the first electrode, iii) a first wiring that is electrically connected to the switching device so as to apply a first voltage to the first electrode, and iv) a second wiring that is electrically connected to the switching device so as to determine a time for applying the first voltage to the first electrode, and (b) the second display part includes a second electrode facing the first electrode.